REMARKS

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,497,656 (Kado et. al) in view of "Dimensional Metrology with Scanning Probe Microscopes" (Griffith et. al). The rejection is respectfully traversed.

In the passage on column 2, lines 42-61 and claim 1 relied on by the examiner in the rejection, Kado is silent as to whether there is relative lateral motion between the sample and the probe tip when they are moved relative towards each other. However, as clearly shown by the plots of Vx and Vz in Fig. 2 and as described in column 3, lines 49-63 of Kado, when Vz is gradually reduced so as to move the sample 5 towards the tip 12, Vx has a constant non-zero value. This means that as driven by voltage Vx from unit 11, the piezoelectric member 1 will move the sample 5 along the x direction relative to the tip, thereby causing lateral motion in the x direction between the tip and the sample. This means that when the distance between the tip 12 and the sample 5 is reduced, there is lateral motion between them. This is contrary to the requirement in claims 1 of "reducing a distance between the sample and a sensing tip without substantially moving the tip and the sample laterally relative to each other" in (b).

Furthermore, Kado requires that "(b) moving one of the cantilever and the sample surface towards the other by a constant given distance so that the probing tip is brought into contact with the sample surface, said constant given distance being determined in advance so as to be greater than a maximum value of height variations of the sample surface within a range thereof to be measured..." Column 2, lines 43-50 of Kado. Height variation of the sample surface is then derived from the amount of deflection of the cantilever 6. Column 3, lines 61-63 of Kado. This means that in order to be able to measure the height variation, the tip must not only make contact with the sample surface, but actually be driven into the surface to cause the cantilever 6 to be deflected. Measurement of the amount of deflection of cantilever 6 then yields the desired result: height variation of the sample surface.

In contrast, in claim 1, distance between the sample and a sensing tip is reduced without substantially rotating the arm about said pivot, until the tip touches the sample. In other words, once the tip touches the sample, distance between the sample and a sensing

tip is no longer reduced, thereby also preventing any substantial rotation of the arm about the pivot. This is again radically different from Kado, who in order to be able to measure the height variation of the sample surface, must continue to drive the sample towards the tip after it contacts the sample if the distance traveled has not reached the value of the "constant given distance." Since this "constant given distance" is chosen to be greater than the maximum value of height variation of the sample surface, this will cause the cantilever 6 to bend at many sampling points of the sample surface. Therefore, even assuming that the examiner is correct in that one skilled in the art would add a pivot to the cantilever 6 of Kado, the end result would cause the cantilever to rotate about the pivot as taught by Kado after the tip touches the sample, contrary to the requirement of claim 1.

Furthermore, we believe that one skilled in the art would not pivot the cantilever 6 of Kado, in view of the fact that Kado's measurement scheme relies on measuring the amount of deflection of cantilever 6. Once the cantilever is pivoted, it would no longer deflect when it comes into contact with the sample. Rather than being deflected, it would simply start to rotate about the pivot. This would cause Kado's scheme to fail altogether, since he is no longer able to measure any deflection of the cantilever. Therefore, we believe that the examiner's view that it is obvious to one skilled in the art to provide the profiler of Kado with a pivot is one that can only be reached by using the applicant's disclosure as a guide, which is improper.

Claims 83-85 have been added to more adequately cover the invention. Claims 1 and 83-85 are presently pending in the application. Reconsideration of the rejection is respectfully requested and an early indication of the allowability of all the claims is earnestly solicited.

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Respectfully submitted,

James S. Hsue — Date 10/5/04

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